

Appl. No. 10/664,981
Amendment dated: July 14, 2004
Reply to OA of: June 16, 2004

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1(original). A semiconductor package, comprising:
a substrate having an upper surface and a lower surface opposed to the upper surface;
a semiconductor chip having an active surface, a back surface opposed to the active surface and a plurality of bonding pads formed on the active surface;
a plurality of conductive devices, the conductive devices formed on the bonding pads and electrically connecting the active surface of the semiconductor chip and the upper surface of the substrate; and
a thermal enhance layer formed on the back surface of the semiconductor chip.

2(original). The semiconductor package of claim 1, further comprising an underfill disposed between the active surface of the semiconductor chip and the upper surface of the substrate.

3(original). The semiconductor package of claim 1, wherein a material of the thermal enhance layer comprises thermally conductive polymer layer.

4(original). The semiconductor package of claim 3, wherein a material of the thermally conductive polymer layer comprises thermally conductive film.

5(original). The semiconductor package of claim 3, wherein a material of the thermally conductive polymer layer comprises thermally conductive epoxy.

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6(original). The semiconductor package of claim 1, further comprising a heat spreader attached on the thermal enhance layer.

7(original). The semiconductor package of claim 6, wherein the heat spreader is a flat heat spreader.

8(original). The semiconductor package of claim 6, wherein the spreader is a cap-like heat spreader.

9(original). The semiconductor package of claim 8, further comprising an adhesive connecting the substrate and the heat spreader.

10(original). The semiconductor package of claim 6, wherein a material of the heat spreader comprises copper.

11(original). The semiconductor package of claim 6, further comprising a stiffener ring connecting the substrate and the heat spreader.

12(original). The semiconductor package of claim 6, wherein the coefficient of the thermal expansion of the heat spreader is substantially the same as that of the semiconductor chip.

13(original). The semiconductor package of claim 6, wherein a material of the heat spreader comprises silicon.

14(original). The semiconductor package of claim 1, wherein the conductive devices are conductive bumps, and the active surface of the semiconductor chip faces and connects to the upper surface of the substrate via the conductive bumps.

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15(original). The semiconductor package of claim 1, wherein the conductive devices are conductive wires, and the back surface of the semiconductor chip faces and connects to the upper surface of the substrate via the thermal enhance layer.

16(original). The semiconductor package of claim 1, wherein the substrate has an opening and the semiconductor chip is disposed in the opening.

17(original). The semiconductor package of claim 1, further comprising a plurality of solder balls formed on the lower surface of the substrate.

18(original). The semiconductor package of claim 1, further comprising an additional semiconductor chip attached on the lower surface of the substrate.

Claims 19-27(canceled).